REMARKS

Claims 1 - 13 are pending and under consideration.

In the Office Action of October 8, 2002, claims 1 - 13 were rejected. The Examiner alleged that:

- claims 8 - 10 are indefinite under §112(2)[2],
- claims 1 - 3, 6, 8, 12 and 13 are anticipated by *Tokuo*[3] under §102(b),
- claim 5 is unpatentable over *Tokuo* under §103(a)[4],
- claims 1, 4 and 11 are unpatentable over *Horie*[5] in view of *Tokuo* under §103(a), and
- claim 7 is unpatentable over *Tokuo* in view of *Nishiguchi*[6] under §103(a).

§112 Rejections

a.) The Examiner alleged that "said axis" in claims 8 and 10 lacks antecedent basis.

Applicant has amended "said axis" in claims 8 and 10 to recite "a central axis". (Referring to the figures, the central axis is the axis which is perpendicular to a point of intersection of the two diagonal lines.) Accordingly, claims 8 and 10 comply with §112(2).

b.) The Examiner fails to understand the differences between "exploiting optical rotating characteristics" and "exploiting birefringence".

Briefly, in twisted nematic ("TN") mode liquid crystals, the optical rotating characteristic, which is the optical activity or rotary polarization, is exploited. But, on the other hand, birefringence is exploited in electrically controlled birefringence ("ECB") mode liquid crystals.

In the ECB effect, the molecule arrangement of the liquid crystals is changed due to the dielectric anisotropy of the liquid crystals. The result is a change in the birefringence in the liquid crystal cells. When a liquid crystal cell is held between two sheets of polarization plates, the change in its birefringence causes a change in light transmittance. Thus, exploiting birefringence in ECB mode (versus exploiting the optical rotating characteristic in the TN mode) is used for changing light transmittance.

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[2] 35 U.S.C. §112, second paragraph.
[3] Japanese patent JP2000075295.
[4] 35 U.S.C. §103(a).
[5] U.S. Pat. No. 6,226,056.
[6] U.S. Pat. No. 5,978,064.

Accordingly, exploiting birefringence (ECB mode) is different from exploiting optical rotating characteristics (TN mode), and claims 8 and 10 are separately directed to each of the two.

c.) The Examiner alleged that Applicant fails to address the relationships between:

"the axially symmetrical orientation of [the] liquid crystals is distorted along [a central] axis" and "optical rotating characteristics" in claim 8, and

"the axially symmetrical orientation of [the] liquid crystals is not distorted along [a central] axis" and "birefringence" in claim 10.

Applicant has amended claim 8 to recite that "the axially symmetrical orientation of [the] liquid crystals is distorted along a central axis and [the] display is performed by exploiting TN mode liquid crystals, which utilizes optical rotating characteristics". Similarly, Applicant has amended claim 10 to recite that "the axially symmetrical orientation of [the] liquid crystals is not distorted along a central axis and [the] display is performed by exploiting ECB mode liquid crystals, which utilizes birefringence". Accordingly, the respective relationships in claims 8 and 10 are recited more clearly, and therefore the claims comply with §112(2).

d.) The Examiner rejected claim 9 because it allegedly depends on an [indefinite] claim.

Claim 8, the claim that claim 9 depends on, is not indefinite as explained above. Accordingly, Applicant respectfully requests that the rejection of claim 9 under §112(2) for depending on an indefinite claim be withdrawn.

§102(b) and §103(a) Rejections

The Examiner has cited *Tokuo*, *Horie* and *Nishiguchi* either individually or in combination for all of the §102(b) and §103(a) rejections in the subject office action.

The cited references disclose liquid crystals comprising a wall structure as an ASM mode, i.e. axially symmetric micro cell mode. None of the cited references, however, teach liquid crystals exploiting axial symmetrical orientation with a groove structure in cooperation with a wall structure as taught and claimed in the present patent application. Independent claims 1 and 13 specifically recite a wall structure, a groove structure, and their implementation interrelated with each other according to the present invention.

Because neither of the three cited references teach such an interrelated wall and groove structure with liquid crystals exploiting axial symmetrical orientation, independent

claims 1 and 13 are both patentable over the three cited references, whether alone or in combination.

Pending claims 3 - 12 are dependent claims that depend on independent claim 1. Because independent claim 1 is patentable over the cited references as discussed above, these dependent claims are likewise patentable over these references because they incorporate the limitations of their parent independent claim.

CONCLUSION

In view of the foregoing, Applicants respectfully submit that pending claims 1 and 3 – 13 are patentable over the cited references. Further, all of the Examiner's objections and rejections have been addressed herein. It is, therefore, submitted that the application is in condition for allowance.

Notice to that effect is respectfully requested.

Respectfully submitted,
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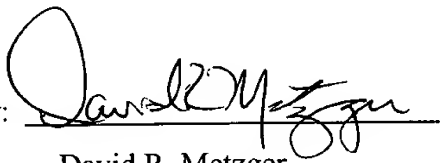
Attorneys for Applicant

Dated: January 2, 2003

By: 

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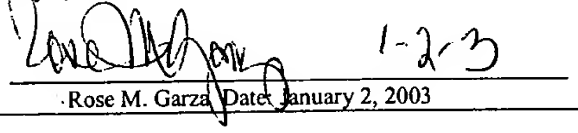

Rose M. Garza Date January 2, 2003

APPENDIX A

The following are marked-up versions of the amended claims:

Cancel claim 2 without prejudice, without admitting anticipation and/or obviousness, and without admitting a non-enabling disclosure therefor.

1. (Once amended.) A liquid crystal display device comprising:

a pair of substrates arranged facing each other with a pre-set gap in-between;

liquid crystals held in said gap;

means for applying an electrical field to said liquid crystals to change the state of orientation thereof;

a wall structure formed in each of small-sized areas obtained on sub-division along at least one substrate for orienting the liquid crystals lying each small-sized area axially symmetrically on application of said electrical field, said wall structure encompassing a rectangular area; and

a groove structure formed in each of said small-sized areas and adapted for adjusting the axial symmetrical orientation of said liquid crystals in cooperation with said wall structure,

wherein said groove structure extends along diagonal lines of said rectangular area encircled by said wall structure.

8. (Once amended.) The liquid crystal display device according to claim 1 wherein the axially symmetrical orientation of said liquid crystals is distorted along ~~said~~ a central axis and display is performed by exploiting TN mode liquid crystals, which utilizes optical rotating characteristics.

10. (Once amended.) The liquid crystal display device according to claim 1 wherein the axially symmetrical orientation of said liquid crystals is not distorted along ~~said~~ a central axis and display is performed by exploiting ECB mode liquid crystals, which utilizes birefringence.

13. (Once amended.) A method for the preparation of a liquid crystal display device comprising a pair of substrates arranged facing each other with a pre-set gap in-between;

liquid crystals held in said gap;

means for applying an electrical field to said liquid crystals to change the state of orientation thereof, said method comprising the steps of

forming a wall structure in each of small-sized areas obtained on sub-division along at least one substrate for orienting the liquid crystals lying in each small-sized area axially symmetrically on application of said electrical fields, said wall structure encompassing a rectangular area; and

forming a groove structure formed in each of said small-sized areas and adapted for adjusting the axial symmetrical orientation of said liquid crystals in cooperation with said wall structure,

wherein said groove structure extends along diagonal lines of said rectangular area encircled by said wall structure.